

From: "Dr. David J. Elton" <elton@eng.auburn.edu>
To: Priscilla Burton <PRISCILLABURTON@utah.gov>
Date: 5/3/03 12:48PM
Subject: Re: Soil Engineering Question

Priscilla:

I got the report. Here are my comments:

54 degrees is possible

the curves don't peak - I don't know why they refer to them as peak strengths

for NP fines, 2000 psf cohesion is very suspect...

I don't understand their spreadsheet data reduction that lists phi for every displacement. How can they tell what phi is? You have to run at least two tests, and plot, etc.

the data is consistent, anyway.

I wonder if the data was reduced correctly.

FYI. Hope this helps.

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On Fri, 25 Apr 2003, Priscilla Burton wrote:

> The fax is on its way. Thank you.
>
> >>> "Dr. David J. Elton" <elton@eng.auburn.edu> Thursday, April 24,
> 2003 6:59:34 PM >>>
>
>
> Priscilla:
>

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> This is a Very high friction angle - unusual.
>
> Please fax the report.
>
> I don't understand how the strength can be characterized as "post-peak"
> if
> the soil continues to gain strength with strain. If, indeed, the
> stress-strain curve is continuing to rise, the test has not been run to
> a
> large enough strain to even see if it does peak, or what its
> "residual"
> strength is.
>
> Usually, three samples are tested to get a strength value. Two is the
> minimum.
>
> de
>
> PS I have relatives in Utah, and just spent a year at Utah State
> University on sabattical. Hope you enjoy Soils Magic!
>
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> On Thu, 24 Apr 2003, Priscilla Burton wrote:
>
> > Hello David,
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> > I attended the Soil Engineering for Non-Soils Engineers in October
> > of
> > 2002. At that time we discussed values for peak friction angles and
> > cohesion. I am writing to ask for your opinion of the following
> > information.
> >
> > I am reviewing a stability analysis where the backfill material is
> > described as GM, a silty gravel with sand; post peak friction angle =
> > 54
> > degrees.
> >
> > The consultant indicates that using post-peak friction angle is
> > appropriate, since the material continues to gain strength after
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> > shearing has begun. The displacement vs shear strength curve
> continues
> > to rise and is nearly linear. The consultant explains that this is
> due
> > to the larger particles in the material rotating and increasing
> shearing
> > resistance.
> >
> > Since this material did not show any clear shearing point, the shear
> > stress vs normal stress plot is of the maximum stresses applied and
> > results in a cohesion of 1,877 psf which seems like a large number
> for a
> > material that is also reported to be coarse and non-plastic.
> >
> > The consultant indicates that post-peak shear strengths are
> typically
> > used in slope evaluation because the conservative assumption is made
> > that the material has already undergone peak shearing.
> >
> > The reported Phi of 54 degrees seems very rare.
> >
> > Questions : Would you agree with this assessment of the typical use
> of
> > post-peak shear strengths for coarse material?
> > Is it possible that a coarse, non-plastic
> material
> > could have such high cohesion?
> > How many soil samples/volume of material are
> > ordinarily run on a material to assure that the material is uniform?
> >
> > If you would like to see the laboratory reports for this material, I
> > will fax them to you.
> >
> > Sincerely,
> > Priscilla. Burton
> > p.s. I bought your Soils Magic book!
> >
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> >
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